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THE EFFECT OF INDIVIDUALIZED VERSUS COOPERATIVE LEARNING ON
ACHIEVEMENT AND TASK PERFORMANCE

A Thesis
Presented to the
Faculty of
California State University,
San Bernardino

In Partial Fulfillment
of the Requirements for the Degree
Master of Science
in
Psychology: Industrial/Organizational

by
Leslie Christine Haile

June 1996

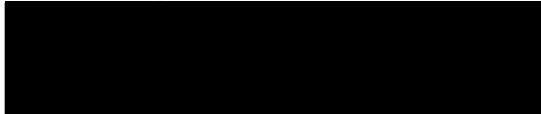
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Approved by:


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ABSTRACT

The present study investigates whether individuals who are trained in groups will benefit from a more enhanced facilitation of the information than those trained in a more traditional, individualistic, classroom setting. Participants who learn in a cooperative, group setting are expected to exhibit better performance on a subsequent knowledge test than participants who learn individually. It is hypothesized that this phenomenon will extrapolate to task performance with the products produced by cooperative groups being of a higher overall quality than those produced by individuals. Participants of a cooperative learning environment are also expected to exhibit greater satisfaction with the tasks and with their performance than participants who learned individually.

Sixty-three CSUSB undergraduate students participated either individually or as members of three-person groups. Participants were assessed on three outcome measures: knowledge acquisition as indicated by a multiple-choice test, task performance, and a variety of satisfaction items. Statistical analyses yielded significant results supporting the hypotheses that group products, reached through cooperative deliberation, are significantly superior to tasks completed by individual participants working alone and that cooperative group members are significantly more satisfied and confident with their performance than individuals working alone. The degree of knowledge acquisition indicated by a multiple choice test was not found to vary significantly as a result of learning condition (i.e., cooperative group or individual).

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After an eighty year investigation of individual versus group performance, researchers remain in a maelstrom of uncertainty regarding the presumed superiority of either format. Due primarily to methodological problems inherent in comparing the two conditions, a conclusive answer remains elusive. Perhaps the answer to the controversy lies not in the prevailing method of investigation which compares individuals and groups on baseline performance. Rather, a more indirect examination of the developmental advantages of learning and working in a group environment may yield the distinction sought by researchers.

The developmental advantages of working in a group setting have received little consideration amid the overwhelming majority of individual versus group research. Prevailing research tends to directly measure performance in terms of the overall quality of decisions produced by a group or individual. This distinction becomes critical when considering the possibility that a group format may actually be able to more effectively facilitate knowledge acquisition, which then extrapolates to increased subsequent performance. Thus, the process of learning in a group can presumably transform several individuals with varying degrees of expertise into a group of highly capable individuals. From an organizational perspective, it would appear preferable to invest the time necessary to develop a group of several highly capable individuals as opposed to maintaining an overdependence on only one highly efficient employee.

While there has been ample research investigating individual versus group performance, there has been less comparable analyses of the effect of individual versus

group instruction on learning. The current study proposes a deviation from traditional methods of comparing individual versus group task performance, toward a learning approach which investigates the developmental advantages of working in a group. The study will investigate the possibility that group learning has an “assembly bonus effect” whereby group members achieve greater facilitation of learning by working in a group setting than they could have achieved by working alone. The following literature review discusses the individual versus group research that forms the foundation upon which the current study is built.

LITERATURE REVIEW

Individual Versus Group Decision Making

Individual versus group performance is a paradigm that has been investigated for years in the psychological literature, yet remains an issue of controversy and speculation. According to numerous widely accepted management and leadership theories, the decision reached by a group is likely to be better than the decision produced by the most knowledgeable member of that group (e.g., Lorge, Fox, Davitz, & Brenner, 1958; Hall, Mouton, & Blake, 1963; Maier & Thurber, 1969; McGlynn & Schick, 1973; Laughlin & Sweeney, 1977; Laughlin & Barth, 1981). However, several researchers have challenged this notion, proposing that under most circumstances, the knowledge base of the most competent group member represents the upper limit of what the group

can be expected to achieve (e.g., Michaelsen, Watson, & Black 1989; Graham, 1977; Harari & Graham, 1975).

Using homogeneous groups whose members possessed similar levels of ability, Barnlund (1959) found group decisions to be superior to individual judgments.

Explanation for the results lie in the premise that membership in a group produces a higher level of interest in successful task completion by the individual members. Thus, membership in a group has an inhibiting as well as facilitating effect on the members based on the fact that group members know they must share their opinions publicly.

This knowledge causes group members to be more cautious and deliberate in their analyses, thus catching errors they might have committed if working individually.

Consequently, it is not necessarily the group's level of experience that produces a superior product, but rather the psychological factors inherent in their discussion.

In a recent examination of individual versus group decision-making, Reagan-Cirincione (1994) found that small, interacting groups performed significantly better than their most proficient members on judgment tasks. However, these results occurred only when the interaction and cognitive processes of the group were supported through the use of a group facilitator, decision modeling technique, and information technology (e.g., high-tech overhead computer system). The question of the practicality of such methods in an organizational setting is questionable.

Although group performance has often been found to be qualitatively and quantitatively superior to the performance of the average individual, it is generally

inferior to that of the best individual (Hill, 1982). However, in an organizational setting, the best, or most capable individual, is not always easily identifiable. Unless sufficient performance data are available regarding a specific task, the most proficient individual cannot be determined prior to assigning and evaluating the final task performance. Thus, the majority of existing studies which support the superiority of individuals over groups, do so based on analyses which are not able to distinguish the most proficient individual until after the task has already been performed.

Provided that the most capable individual can even be determined, the long-term organizational benefits of assigning that one person to a project are not clear-cut. Although the most capable person will generally produce a superior product to that of a group in the short run, the benefits of this situation in the long run are not as evident. What happens to organizational quality if that one best individual were to leave the organization? In that situation, it would have been far better to have had the most capable individual work as the member of a group so that other group members could benefit from his or her expertise. Thus, although requiring the most capable individual to work in a group might initially impede his or her efficiency, it is more likely that by working in a group that capable individual would impart his knowledge to everyone, thus increasing the capability of every member of the group. The organization would now have an entire group comprised of capable individuals who are each qualified to complete the job individually, if necessary. Although the initial efficiency of working in a group setting will most likely not be equal to that which could be obtained by the most capable

individual working alone, the results in the long run will be more beneficiary to the company which is left with a group of capable individuals as opposed to only one.

Individual Versus Group Task Performance

Although there appears to be a wide variety of research in the literature examining group decision-making, significantly less emphasis has been placed on investigating the factors behind group *task* performance. According to McGrath (1984), before an assessment of group performance can be determined, the nature of the task must first be examined; in particular, the interdependence of the task. McGrath suggested that most group tasks can be classified into categories that reflect four basic processes: generate, choose, negotiate, and execute tasks. The majority of the individual versus group research concerns decision-making, which does not directly address tasks which fall in the execute quadrant of McGrath's task classification. Not only is the actual task important, but the level of interdependence of the task is also critical.

A hierarchy of task interdependence proposed by Thomson (1967) defines task interdependence in terms of the exchange of information or resources. According to Thomson, *pooled interdependence*, or a situation where each group member contributes to the final product without the need for interaction with other members, is one way that group members exchange information and resources. Thus, group performance is measured in terms of the sum of individual group member performance.

In the case of *sequential interdependence*, group members have different roles and perform different parts of the task in a prescribed order. Thus, one group member must complete their segment of the group task before another member can act on their portion. Under *reciprocal interdependence*, one group member's output becomes another member's input and vice versa. Often, group members assume different roles and can perform different parts of the task.

When group members come together to jointly diagnose, problem solve, and collaborate to complete the group task, they are operating in a *team interdependence* mode. The present study utilizes this team interdependence mode, in which members of small groups will jointly complete a specified task which requires them to recall, integrate, and apply what they have learned in a group setting.

The practicality and level of complexity of the task that groups and individuals are asked to perform are a primary criticism of much of individual versus group research. Watson, Michaelsen, and Sharp (1991) noted that most previous studies have required subjects to perform a trivial task that was foreign to the setting in which it was employed (e.g., solving anagrams, survival games, and guessing the ending to a mystery film).

In an attempt to create a setting more representative of organizational work groups, Michaelsen, Watson, & Black (1989) collected data from experienced individuals and groups engaged in realistic tasks which had personally consequential outcomes (i.e., reward). The task involved a series of six individual and group tests containing 12-18 multiple-choice and true/false questions. Test questions were approximately 40% recall,

40% application, and 20% analysis. Results supported the premise that a vast majority of groups can outperform their most knowledgeable member. However, the study utilized groups whose member composition had been manipulated to ensure that potential resources were spread evenly among all the groups. Individual resources are not always so equally distributed in a realistic organizational setting. In fact, in some organizations, work groups are comprised of the most qualified individuals, whereas other groups may have a more diversified mixture of ability levels.

Much of the research investigating individual versus group decision making is severely flawed and leaves much speculation as to its generalizability to other groups. The artificial nature of many research groups, the decision-making tasks the groups are asked to perform, and the settings in which they perform these tasks, cast doubt on whether or not the results can realistically be generalized to actual workgroups in organizations.

In comparing individual and group performance, studies often distinguish individuals as being more efficient in terms of the time it takes them to complete a project as compared to the time-consuming interactions of a group. While the coordination and communication processes of groups will certainly decrease the *speed* at which a group can perform, we must not discount the potential increases in *quality* that may result.

Criticisms of Individual Versus Group Research

A flaw in the research design of many pre-existing studies of individual versus

group decision making concerns the actual decision that groups are asked to make. The complexity of the experimental tasks are often clearly limited compared with most organizational situations where decision makers are typically faced with issues that are too broad-based to attack directly (Michaelson et al., 1989). In many organizational situations, the right answer is simply not known and it is impossible to provide definitive feedback on either individual or group performance.

Overall, the research regarding group versus individual decision-making and task performance is equivocal. Although significantly more research exists regarding individual versus group decision-making, as opposed to performance in actual task execution, relatively little research has addressed the potential effect that the instructional environment (i.e., cooperative group versus traditional individualistic) can have on an individual's ability to learn and effectively apply information.

Individual Versus Group Learning

Although both individual and group learning conditions are utilized in classrooms and organizational settings, the question remains as to whether one format has the ability to more effectively facilitate knowledge acquisition than the other. If one method is characterized as superior, it is presumable that members of that condition will exhibit enhanced subsequent performance. Thus, it is arguable that either individual or group learning environments will be associated with better performance if each situation facilitates a different degree of knowledge acquisition. In particular, training individuals

in either an individualistic setting or as members of small groups should affect their level of knowledge acquisition as well as how effectively they are able to apply that information.

Transactive Memory Systems

Liang, Moreland, & Argote (1995) proposed and tested a theoretical account for the superiority of the effects of group training, as opposed to individual training, on learning and subsequent performance. This premise is based on Wegner's (1986) notion of transactive memory, which proposes that shared experiences often lead groups of people to encode, store, and retrieve information together. The resulting transactive memory system is a combination of both the knowledge possessed by particular group members, as well as an internal awareness of specifically who knows which element of information.

Using a radio assembly task, Liang et al. (1995) found that groups whose members were trained together recalled more about the assembly procedure and produced better-quality radios than groups whose members were trained alone. Consequently, training group members together appeared to improve their overall group performance primarily by fostering the development of transactive memory systems which presumably leads to increased performance once back in an organizational setting.

Unfortunately, organizational work groups do not always remain intact once back on the work site. Thus, critics have argued that group training is probably impractical

because of individual group member turnover (e.g., Druckman & Bjork, 1991).

However, this criticism fails to address the possibility that there is a potential increase in each individual member's level of skill as a result of the group training condition. It stands to reason that not only will a group whose members were trained together work more effectively together, but also that members will acquire a deeper and broader understanding of the material. Thus, learning in a group environment is more beneficial to the group members regardless of whether or not the group remains intact once back in a work setting.

Cooperative Learning

The increased benefits associated with small group instruction is not a new idea. Known in the teaching literature as cooperative learning, this technique of structuring people into small groups to work together on learning activities has been shown to be an effective motivator of students in encouraging their classmates to excel (Slavin, 1980).

Under a cooperative learning environment, achievement is positively correlated; when one member achieves his or her goal, all other members achieve their goals as well. Under a more traditional individualized setting, individual goal achievement is independent; the goal achievement of one person is unrelated to the achievement of any other individual (Deutsch, 1962). These two methods of structuring the presentation of information presumably promote different learning outcomes as they encourage different interaction patterns among the individuals (Johnson et al., 1976).

Previous studies comparing achievement in cooperative as opposed to individualistic settings have generally found that achievement is higher in cooperative settings (e.g., Hamblin, Buckholdt, Ferritor, Kozloff, & Blackwell, 1971; Hamblin, Hathaway, & Wodarski, 1971; Hudgins, 1960; Wodarski, Hamblin, Buckholdt, & Ferritor, 1973). Many of these studies utilized a simple cooperative technique in which students worked in small groups on a task completion project and turned in one end-product for the entire group (e.g., Johnson, Johnson, & Anderson, 1976; Johnson, Johnson, & Scott, 1978). In this cooperative environment, no formal reward is given to any of the individual group members and praise for performance is directed toward the group as a whole.

While primarily conducted in an academic context, cooperative learning research overwhelmingly supports the idea that cooperative learning techniques result in higher achievement than traditional forms of learning (Johnson, D., & Johnson, R., 1986). Although results regarding achievement tend to support the superiority of a cooperative environment, they appear to depend to a certain extent on the particular techniques, settings, measures, experimental designs, and other characteristics of the situation (Slavin, 1980). A potential explanation for the differing benefits in academic achievement found in prior studies concerns differences in methodology. For instance, studies that are more rigorous might be less likely to find significantly positive effects than less rigorous ones. In fact, the most effective cooperative technique, the Teams-

Games-Tournament (TGM), lacks experimental rigor as it doesn't require that control groups be held to the same schedule of instructions as experimental, cooperative groups.

Support for a reduction in rigor has been shown particularly with regard to high level cognitive learning outcomes (e.g., identifying concepts, analyzing problems, making judgments and evaluations). In these circumstances, less structured cooperative techniques that involve high student autonomy and participation in decision-making may be more effective than traditional individualistic techniques (Slavin, 1980).

Although there has been substantial research investigating the effect that cooperative learning has on achievement and motivation, the predominant amount of this research has been in the context of elementary to secondary school children. Cooperative learning was born out of a desire to change the social stigma that children who excelled in an academic setting were forced to endure from their peers. In traditional classrooms, students suffer social consequences for academic success, whereas a cooperative structure allows students to encourage their classmates to excel when rewards are contingent upon group performance (Slavin, 1980). Cooperative learning techniques portray academic success as a socially desirable behavior, thus students feel more motivated to achieve when they are no longer facing potential social rejection by their peers. However, at a college level, and particularly at an organizational level, achievement and high performance are perceived to be desirable behaviors. Thus, unlike the elementary and secondary environments in which individuals suffer consequences for academic success, the motivational philosophy behind cooperative learning does not seem as applicable to

organizational settings where people presumably already possess the motivation and desire to achieve. Rather, the beneficial aspects of cooperative learning with regard to an increased proficiency and integration of training material warrants further investigation.

Cooperative learning techniques have traditionally been effective because they enhance performance by affecting the social approval and achievement motives (Daniels, 1994). Research has also found support for the premise that cooperative learning enhances performance by requiring students to use more sophisticated cognitive strategies while preparing for examinations (Matlin, 1994). This suggests that students are encouraged to examine the information more thoroughly and critically than they would do on their own.

In an examination of whether cooperative learning techniques lead to improved test performance and increased approval and achievement motivation as compared with traditional, individualistic learning techniques, Daniels (1994) found that that using cooperative learning techniques did have a significant effect on the motivation of college students; however, this increased motivation did not extrapolate to performance.

Potential explanations for this lack of increased performance may lie within the absence of a real reward. Another possible explanation of these results is that it is not enough for cooperative groups to merely “study together” for a quiz, but that the group must apply the material during a pre-test exercise, in order to increase overall retention of material.

Johnson et al. (1976) found that students studying cooperatively outperformed students who studied individually on daily assignments, when tested within their

cooperative groups. Although no significant difference was found between the two conditions on a review test given individually, results must be accepted with caution as only one teacher and the students from one classroom consisting of 30 fifth-grade, white, working class children participated in the study.

Despite the methodological deficiencies, these findings are in accordance with the majority of the existing research which supports the premise that cooperative learning is associated with higher daily achievement results, but little to no difference on an overall review test when given individually. When the review test is taken cooperatively by the students in the cooperative condition, and individually by students in the individual condition, the cooperative groups do better. These results seem to support the notion that cooperative learning provides individuals with only a piece of the greater body of knowledge, and that only when all members of a group come together can the entire puzzle be assembled. However, it is plausible that, given the right conditions, cooperative learning can facilitate greater understanding of the entire picture in all group members, therefore giving them the necessary resources to excel on an individual test of knowledge.

Johnson et al. (1978) found results which indicate that in cooperative learning conditions students are more accurate in their daily work and work faster when compared to students in an individualized condition. Although, once again, results were mixed when students in the cooperative condition took a final retention test individually,

nothing was lost in terms of achievement, and much more was gained in terms of positive student attitudes and student socialization.

Results from the cooperative learning literature suggest that subjects are more accurate in their daily work and work faster when they learned in a cooperative environment as opposed to an individualized one. Research further indicates that as the training material becomes more difficult and as the cooperative groups become more experienced in working together, the advantage of cooperative learning increases (Johnson et al., 1976).

THE PRESENT STUDY

The present study proposes that individuals who are trained in groups will benefit from a more enhanced facilitation of the material than those trained in a more traditional, individualistic, classroom setting. Thus, even if the eventual membership of the group is disrupted, the remaining members will still function at a higher level than had they learned the information individually. Therefore, learning in a group environment will actually increase an individual's ability to remember, integrate, and apply information. It is hypothesized that a group application of the material will encourage individuals to see the information from multiple perspectives, and will actually aid them in understanding elements of the material that they would not otherwise have discovered. Thus, once again, an "assembly bonus effect" is proposed with regard to learning.

Hypotheses

Hypothesis 1. Participants who learn in a cooperative, group setting will exhibit better performance on a subsequent knowledge test than that of participants who learned individually.

Based on the premise that a group learning format will more effectively facilitate knowledge acquisition, it is hypothesized that this phenomenon will also apply to task performance.

Hypothesis 2. The products produced by cooperative groups will be of a higher overall quality than those produced by individuals.

Based on the premise that learning in a group environment facilitates knowledge acquisition and increases the quality of the task, participants of a cooperative learning environment should exhibit greater satisfaction and confidence as a result.

Hypothesis 3. Participants who learn in a cooperative, group setting will be more satisfied with the tasks and with their performance than participants who learned individually.

In accordance with Kraiger et al. (1993), a construct-oriented approach is emphasized in the present study as a means of identifying not only the instructional objectives (e.g., specific knowledge) but also the most appropriate mechanisms (i.e., individual or cooperative learning environments) for facilitating individual development toward those objectives.

Small-group researchers have noted that group performance cannot be fully understood without taking into account the nature of the task being performed (e.g., Hackman, 1968; Hackman & Morris, 1975). The present study will utilize a task that requires group members to work together in a cooperative fashion, yet does not necessitate interdependence. Thus, it is equally manageable for both groups and individuals.

Method

Subjects

Data were collected from sixty-three undergraduate students at California State University, San Bernardino. Eleven groups, each comprised of three individuals, were formed from thirty-three of the subjects, with the remaining thirty participants working individually. Subjects were randomly assigned to either the cooperative or individual learning condition.

No power analysis was calculated for the group level analyses as no pervasive method of power analysis exists within the group literature. Nevertheless, considering

the present method of analysis at the individual level, to obtain a medium effect size at power .80 and $\alpha = .05$, sixty-four subjects would be required (Cohen, 1992).

Procedure

The study was conducted in three phases: pre-training evaluation and assignment to test conditions, training sessions, and post-training evaluation.

Pre-training Evaluation

Prior to beginning the study, subjects completed a brief questionnaire (Appendix A) measuring demographics and prior experience with introductory Psychology courses. Students who had recently taken an introductory course in psychology were excluded from the experiment. However, as the study uses psychological material covered late in the quarter for relevant psychology courses, students currently enrolled were not excluded.

Subjects were randomly assigned to either a cooperative group or an individual condition. Those assigned to cooperative settings were grouped into 3-member teams. Both instructional settings served two distinct purposes: to prepare its members to do well in a subsequent test of their knowledge, and to facilitate completion of a project applying principles presented in the learning materials.

Training Sessions

All participants, regardless of condition, were given identical learning materials: three pages of reading material containing broad descriptions of psychological disorders (Appendix B). The reading materials were taken from an existing CSUSB psychology course and reflected introductory level subject matter. The information presented included an introduction to a number of psychological disorders (e.g., dissociative disorders, anxiety disorders).

Regardless of experimental condition, the participants were given up to thirty minutes to review the materials. At the conclusion of the thirty-minute time period, a study guide was distributed (Appendix C). Each participant in the individual setting received *his or her own* study guide, whereas each group received *only one* study guide for the entire group to share.

Participants in the individualistic condition were instructed to complete their study guide alone, avoiding interaction with others. Participants in the cooperative condition were instructed to work together in a discussion format to complete the study guide together. Although a research assistant was present in the room, group members were instructed to seek help and clarification from each other rather than from the assistant. To reduce the process losses inherent to most groups, instructions suggested that the group follow a more organized method of interaction. In particular, groups were instructed to appoint one member to record the group's responses to each study guide item. In an attempt to ensure that groups did not merely break the study guide up into

sections to complete in separate sub-groups, they were instructed to review the study guide item by item, completing each item as a group. Although they completed the study guide and assignment as a group, each member was informed that he or she would be required to recall the information *individually* during a subsequent test.

Again, both the individuals and the groups had a maximum of thirty minutes to complete their study guides; however, they were allowed to finish and turn in their training materials at any point before the thirty minutes had ended. Participants were then asked to complete an assignment requiring them to apply the information presented in the training materials.

Researchers of group phenomenon have encountered difficulty in measuring the efficiency and accuracy of group decision-making or problem solving. To be realistic, problems should be complicated enough so that they can not be solved by intuition alone (Barnlund, 1959). Thus, the present task consisted of a series of five mini-scenarios which incorporated several of the psychological disorders discussed in the training materials (Appendix D). Participants were required to answer a series of questions pertaining to the scenarios. The questions were designed to assess whether the participants were able to apply the information from the training materials to the particular setting in the scenario. The complexity of the task was designed at a level that is typical of most introductory psychology courses, however, there was not always one best answer. This is in accordance with the greater body of organizational situations in which the correct answer is simply not known. However, the difference between a right

and wrong answer was clear and demonstrable. For example, scenario one describes an individual experiencing a panic attack yet the person being depicted also exhibits some signs of obsessive-compulsive disorder. Thus participants received credit for either answer.

Performance was assessed in four areas: analytical ability (as indicated by the correctness of the solutions); breadth and depth (as indicated by the degree to which the answers reflected key issues and demonstrated an understanding of the reading materials); written communication skills (as indicated by the ability to write using proper grammar, spelling and convey ideas clearly); and attention to detail (as indicated by the ability to address every element of the problem/question).

Instructions for both conditions suggested that the task should take approximately thirty minutes to complete; however, no time limit was imposed and the participants were instructed to turn in the assignment when they were finished. Each participant in the individual setting received their *own* assignment sheet and set of instructions, whereas group members received *only one* per group.

In the *cooperative* condition, subjects were instructed to work together as a group to complete the assignment. All group members were encouraged to participate and seek help and clarification from each other. As with the instructions for completing the study guide, each group was instructed to appoint one member to record the group's responses to each question. Groups were then required to go through each item one by one, discussing and justifying why they believe each answer to be correct.

In the *individualized* condition, subjects were instructed to work on their own and were informed not to interact or corroborate with other subjects. As they were not allowed to interact with others, they were instructed to answer the questions on the assignment sheet without discussing them.

Post-training Evaluation

Instructional programs must be evaluated in order to determine whether the training objectives were achieved (i.e., did the trainees learn the information), and whether or not the accomplishment of those objectives results in enhanced performance. Campbell (1988) places greater emphasis on the importance of determining whether or not trainees have *learned* the material. Kraiger et al. (1993) suggest that learning outcomes are multidimensional (i.e., learning may be evident from changes in cognitive, affective, or skill capacities). Further, they posit that progress in the training field requires taking a construct-oriented approach to learning.

Outcome Measures

Three outcome measures were assessed: individual degree of learning (i.e., achievement as indicated on a test of knowledge), performance (i.e., quality of the final product), and individual level of satisfaction with the task and the learning environment.

An issue of the validity of individual versus group research concerns whether an accurate assessment of learning and performance can be conducted after a relatively short

amount of time (i.e., assessing individuals after only 1-2 hours). In addressing this concern, Kraiger et al. (1993) contend that from a psychometric perspective, variance among trainees with regard to verbal knowledge should be greater earlier in training than toward the end. Consequently, evaluating the trainees early in the training process will have the greatest use for predicting other learning outcomes. Thus, for the purpose of the present study, an assessment was conducted after only a 30-minute instruction period, followed by a 30-minute application period.

Degree of Learning

The measure of knowledge acquisition used in the present study varies little from traditional methods of assessing an individual's degree of learning. A multiple-choice, true/false test format was utilized and the participants were given unlimited time to complete the exam (Appendix E). Items were chosen from existing exams currently being used in undergraduate psychology courses at CSUSB. An item analysis conducted on data collected from previous introductory psychology courses aided in selecting items which were shown to have high discriminability. These items were utilized in the multiple choice test.

In accordance with Ackerman and Humphreys (1990) the test format should depend on the construct to be measured. As opposed to a straight speed test, an unlimited time frame creates a "power" test which assesses the accuracy of the stored information as opposed to the rate at which individuals can access knowledge.

Task Performance

Raters blind to the research condition assessed the accuracy and thoroughness of the individual and group assignments. A key, developed prior to the experiment, assisted the raters in evaluating the answers along a variety of dimensions (Appendix F). The key provided objective criteria for evaluating performance, leaving little room for subjective rater interpretation. A two-person rating team came to consensus and assigned one rating per group on each of four dimensions of performance: analytical ability, breadth and depth, writing composition, and attention to detail. Individual consensus ratings were then randomly combined to form nominal groups of three. The average ratings of the nominal groups were then compared to the overall ratings of the experimental groups to evaluate overall performance.

Satisfaction

Depending on membership in individual or cooperative condition, one of two versions of a brief questionnaire was given to participants upon completion of the multiple-choice test (Appendix G). The questionnaire contained items which assessed their satisfaction with the content of the training material, the task, the learning environment, and their degree of familiarity with the subject matter. Items were measured with five-point response formats ranging from 5 = “strongly agree” to 1 = “strongly disagree”. Ratings on three satisfaction items measuring satisfaction with performance, satisfaction with task, and satisfaction with learning condition, were

combined to create an overall satisfaction scale. An internal consistency analysis of scale items revealed an alpha of .75.

Results

The first concern was to examine the learning effects in terms of knowledge acquisition between cooperative group members and participants of the individual condition. Next, differences in performance were examined. The self-report measures were then analyzed to ascertain the participants' feelings about the task, their performance, and their learning environment. Although all propositions were directional, the more conservative, two-tail probabilities are reported.

Comparative Knowledge Acquisition of Participants

Hypothesis 1 asserts that cooperative group members will exhibit better performance on a subsequent knowledge test than participants who learned individually.

Table 1 contains a summary of the descriptives for the test results.

Table 1
Descriptive Statistics for Individual, Group, and Total Test Scores

Condition	<i>M</i>	<i>SD</i>	Range	N	Skewness	Kurtosis
1. Individual	12.13	2.86	11.00	30	-.43	-.12
2. Group	11.09	2.10	8.00	33	-.08	-.87
3. Total ^a	11.59	2.53	11.00	63	-.12	-.34

^atotal reflects the dispersion of all test results, regardless of experimental condition.

Although there was sufficient power to conduct an independent means comparison analysis, no significant difference was found between the test performance of the participants regardless of learning environment, $t(61) = 1.66, p > .05$. Thus, Hypothesis 1 was not supported. A boxplot graph of the nonsignificant difference between the data reflects the slight elevation of individual mean scores over the scores obtained by cooperative group members (Appendix H).

Comparative Task Performance of Participants

Table 2 contains a summary of the mean and standard deviations of the performance scores for cooperative and nominal groups.

Table 2
Descriptive Statistics for Cooperative and Nominal^a Group Performance Scores

Condition	No. of Groups	N	AA*		BD*		WC*		AD*		TOTAL	
			M	SD	M	SD	M	SD	M	SD	M	SD
1. Cooperative	12	33	3.72	1.24	3.6	1.12	4.33	.88	4.85	.30	16.58	2.13
2. Nominal	10	30	2.55	.81	2.61	.96	3.37	.75	3.98	.64	12.42	2.51

^a“Nominal” groups are formed by averaging the scores of three randomly selected individuals to produce one group score.

*AA=Analytical Ability; BD=Breadth and Depth, WC=Writing Composition, AD=Attention to Detail

Additional mean comparison analyses were conducted to compare the task performance of cooperative groups and individuals. After randomly combining individual ratings to form nominal groups of three, an aggregate of those three ratings was taken. Overall aggregate scores for each nominal group were produced for each of

the four measures of performance: analytical ability, breadth and depth, writing composition, and attention to detail. An overall performance score was also calculated.

An independent level t-test was conducted to compare the nominal and experimental group means on the overall measure of performance. Results indicated that the projects completed by the cooperative groups were significantly higher in quality than those produced by individuals, $t(19) = -4.11, p = .001$. Thus, Hypothesis 2 was supported. A boxplot graph of the data depicts the difference in scores, with the mean of cooperative groups clearly elevated above that of nominal groups (Appendix I).

To further understand the difference between individual and cooperative group performance, post hoc comparisons of each of the four subsets of knowledge were computed. To correct for family-wise error, a more conservative two-tail alpha level of .05 was used. Group products were superior within each of the four subsets of performance: analytical ability, $t(19) = -2.69, p = .01$; writing composition, $t(19) = -2.71, p = .01$; breadth and depth, $t(19) = -2.40, p = .03$; and attention to detail, $t(11.11) = -4.07, p = .002$. The Levene's test for equality of variances revealed that variances were significantly different for attention to detail, $F = 17.456, p = .001$, thus the unequal t-test comparison was reported for that measure. As indicated by boxplot graphs of the comparisons, cooperative group mean scores are clearly higher in value than nominal groups (Appendix J).

Comparative Satisfaction of Participants

Hypothesis 3 suggests that participants who learn in a cooperative group setting will be more satisfied with the tasks and with their performance than participants who learned individually. Table 3 contains descriptive statistics for satisfaction.

Table 3
Descriptive Statistics for Individual and Cooperative Group Satisfaction

Condition	N	Satisfaction with Performance		Satisfaction with Task		Satisfaction with Condition	
		M	SD	M	SD	M	SD
1. Individual	30	3.69	1.00	3.34	.83	3.52	.99
2. Cooperative	33	4.30	.95	3.94	.93	4.39	.79

A t-test comparison was conducted to compare the degree of overall satisfaction reported during a self-report evaluation completed by participants of both conditions. Results indicated that participants of the group condition were significantly more satisfied with their experience than those individuals working alone, $t(60) = -3.75, p = .000$. Thus, Hypothesis 3 was supported, as depicted by a boxplot graph of the data (Appendix K).

To further assess the difference in degree of satisfaction between individuals and cooperative group members, additional post hoc comparisons were conducted between each of the three subscales of satisfaction: satisfaction with performance, satisfaction with task, and satisfaction with learning environment. To correct for family-wise error, a more conservative two-tail alpha level of .05 was used. Bonferroni analysis revealed that cooperative group members enjoyed the task significantly more than participants who worked individually, $t(60) = -2.69, p = .012$. In addition, participants of the group condition enjoyed working *with their groups* on the project significantly more than

condition enjoyed working *with their groups* on the project significantly more than individuals enjoyed *working alone* on their project, $t(60) = -3.89, p = .01$. Cooperative group members were also more satisfied and confident with their performance than those participants working individually, $t(60) = -2.47, p = .02$. Boxplot graphs of the data clearly depict the elevation in satisfaction exhibited by the cooperative group members (Appendix L).

Correlation Among Variables

Table 4 provides a correlation matrix of the outcome variables of interest: measure of knowledge acquisition (test score), measure of task performance (total performance score), measure of satisfaction with the task, and measure of confidence with the decisions made. A full correlation matrix of all variables is included in Appendix M.

The score that an individual received on the multiple choice test was significantly correlated with their overall performance rating. In addition, the higher the performance rating received by an individual, the more satisfied they were with their performance and with the task in general.

Table 4
Correlation of Individual Test, Performance, and Satisfaction Measures

Variable	1.	2.	3.	4.	5.
1. Test Score	-				
2. Performance Score ^a	.25*	-			
3. Satisfaction with performance	-.10	.28*	-		
4. Satisfaction with the task	-.03	.48**	.45**	-	
5. Satisfaction with the condition	.08	.42**	.56**	.51**	-

* $p < .05$ ** $p < .01$ ^a Performance score refers to total performance. For a breakdown by each of the four kinds of performance, see Appendix A1.

Additional Analyses

To investigate the potential that participants' preexisting preference for individual or group work may have influenced their performance, a repeated measures t-test was conducted between participants' responses to the following two survey items:

- I prefer to work in a group.
- I prefer to work alone.

Results revealed no significant difference ($t(58) = -.75, p > .05$)

Although all participants had an unlimited amount of time to complete their assignments, cooperative group members expressed that more time would have improved their group's performance significantly more than those working individually, $t(59) = -2.10, p = .05$. This suggests that people felt pressured to accomplish the task quickly despite the flexible time limit. An initial concern had been that groups would take significantly longer to complete the task than those individuals working alone. Results actually indicated the reverse as individuals took an average of seventeen minutes to complete the task, while cooperative groups took an average of only fifteen minutes. This difference in time taken to complete assignments was not significant, $t(31.79) = 1.39, p > .05$.

Discussion

The results of this study indicate that the task performance of groups and individuals within the context of a learning environment do indeed differ. Although, as

initially predicted, the groups did not demonstrate superior knowledge acquisition, they did indicate a greater enjoyment of the task and learning environment.

Individual versus Group Knowledge Acquisition

It was hypothesized that cooperative group members would score higher on a subsequent test of knowledge acquisition than those trained individually. Results did not indicate a significant difference between the conditions. This finding, however, does not negate the potential learning advantages inherent to a group environment. Instead, it questions whether or not the assessment method was an appropriate measure of knowledge acquisition. The items on the seventeen question multiple-choice test were perhaps more appropriate for assessing superficial, definitional learning as opposed to evaluating a deeper, more analytically-based form of knowledge. A test similar in principle to the task utilized in the study may have been more appropriate. Designed in either a multiple-choice format with items referring to mini-scenarios similar to those utilized in the assignment segment, or an essay-style examination may have been more valid for assessing knowledge acquisition.

Working in the group environment encouraged the group members to learn the information in a different format by requiring them to discuss the issues. This discussion presumably increased the depth of knowledge acquired as well as the interconnectedness of the knowledge structures. Thus, the benefits of the group environment transcend a superficial familiarity with the material into a deeper, more analytically-based ability to

utilize the information. A test which requires participants to synthesize information to identify solutions may have been a more valid indicator of knowledge acquisition.

Although the difference was not significant, results indicated that individuals obtained higher test scores than group members. A potential explanation for these results is that the time pressure indicated by cooperative group members may have negatively affected their ability to recall information during the test.

An increase in knowledge acquisition may also have been facilitated better in a classroom format where there is generally an increased motivation to learn. The present study attempted to remedy this concern by using material from undergraduate psychology courses and utilizing participants who were currently enrolled in those classes. Doing so presumably increased the participant's motivation to learn the information.

Individual versus Group Task Performance

The tasks completed by cooperative groups were found to be clearly superior to those produced by individuals. Cooperative groups obtained overall mean scores that were significantly higher than those of the nominal groups. These findings also hold true when analyzed separately for each of the four subscales of performance: analytical ability, writing composition, attention to detail, and breadth and depth.

While the performance of cooperative groups was clearly superior to individuals, determining what to attribute the results to is decidedly more difficult. One theory is that the quality of group products is elevated as a function of the input of the group's most

capable member. Thus, the other less capable group members exhibit a performance level higher than that which they would attain working alone. However, this viewpoint does not seem likely given the test scores which indicated no significant difference between conditions with regard to knowledge acquisition. Therefore, it does not appear that groups enjoyed the advantage of having a number of highly capable individuals. Rather, it seems more plausible that the superior group performance was a result of psychological factors inherent in discussion. Participation in a group has been shown to lead to more serious concentration on the task and encourage more enthusiastic individual effort (e.g., Barnlund, 1959). Group discussion has also been found to stimulate more careful thinking, and increase consideration of a wider range of alternatives.

The present study required a thorough analysis of the material in order to develop appropriate solutions. Very often, this required participants to go beyond a superficial analysis of the data and probe for additional information. For instance, one mini-scenario depicted a young woman going to a job interview and experiencing the symptoms of a panic attack; however, the reading materials explicitly stated that experiencing anxiety before a job interview is completely normal. Yet, only one of the thirty individuals realized this fact, whereas four of the twelve groups correctly identified the solution.

Although the cooperative groups exhibited increased performance, it is possible that they could exhibit an even higher level of performance after working together for extended periods of time. Levine and Moreland (1991) argue that as group members gain experience in a work group, they acquire social knowledge about the group's structure; its

culture, norms, methods of coordination; and task performance strategies. Presumably this increased familiarity with the group would decrease the amount of coordination time necessary to arrive at a consensus. An initial concern of the present study was that groups would require significantly more time to complete their assignments due to coordination and interpersonal issues. This did not seem to be an issue as times were fairly comparable for both conditions. However, participants of the group condition did indicate that they felt that more time would have enhanced their group's overall performance. Therefore the group condition may have created a sense of urgency and pressure to complete the task quickly.

Individual versus Cooperative Group Member Satisfaction

Participants of the group condition were significantly more confident with the decisions they made and enjoyed the task significantly more than participants who worked individually. Trainee reaction is critical to the overall success of a training program. Although satisfaction with the learning environment is not always correlated with performance, it makes little sense to run a training program that results in participants having unfavorable reactions (Goldstein, 1993). Thus, a positive reaction to training is in itself a benefit of a particular training or instructional method.

Limitations of Present Study

The validity of test items is a primary limitation of the present study. As

discussed earlier, the items on the seventeen question multiple-choice test were perhaps more appropriate for assessing superficial, definitional learning as opposed to evaluating a deeper, more analytically-based form of knowledge. Although items selected for inclusion on the test had proven to have high discriminability, they may have only been valid for traditional classroom examination in which students had the opportunity to study in advance for the examination.

Despite the fact that all participants had an unlimited amount of time to complete their assignments, cooperative group members expressed that more time would have improved their group's performance. This suggests that group members felt more pressure to accomplish the task quickly despite the flexible time limit. This increased pressure may have affected their performance on the subsequent test of knowledge acquisition.

Another potential limitation concerns the generalizability of the results to work groups in an organizational setting. As much of the previous research on cooperative learning took place in the educational arena, the present study also utilized a similar format. Although college-level students were used, as opposed to the more traditional studies conducted using elementary school children, there is still a question as to whether the participants were representative of employees in a work setting. In addition, although attempts were made to utilize an analytically-based task with more than one appropriate answer, it was not as ambiguous or complex as many of the situations encountered in the workplace.

The overall length of time that the group was together for the purposes of the present study was relatively brief. Critics of group research often cite these short interaction periods as non-representative of actual group experiences. With such a brief interaction period, group processes are not able to advance as much as they would had the group been given the opportunity to work together for an extended period of time. Thus, it is possible that given more time together, the work groups could have increased the quality and efficiency of their work.

Motivation to learn may have been another limitation of assessing knowledge acquisition in a laboratory design. Although the present study attempted to partially remedy this concern by using material from undergraduate psychology courses and utilizing participants who were currently enrolled in those classes, it is not certain whether that provided adequate motivation to learn the information.

SUMMARY

The knowledge acquisition, task performance, and degree of satisfaction of individuals working alone and individuals working together in cooperative groups were compared. Knowledge acquisition was measured with a traditional, multiple-choice style format consisting of seventeen items. Four separate types of performance were measured: analytical ability, breadth and depth, writing composition, and attention to detail. An overall performance score was also calculated as a composite of all four subscales. The results indicated that:

1. The degree of knowledge acquisition indicated by a multiple choice test did not vary significantly as a result of learning condition (i.e., cooperative group or individual).

2. Group products, reached through cooperative deliberation, were significantly superior to tasks completed by individual participants working alone.

3. Cooperative group members were significantly more satisfied and confident with their performance than individuals working alone.

Overall, results indicate that training and coordinating employees in the workplace as members of cooperative groups may lead to improved performance and greater satisfaction.

In future studies, researchers should investigate variants of the test structure utilized in the present study, as well as a longer time frame with which to assess knowledge acquisition. Finally, the overall performance is likely to vary as a function of the difficulty of the task. Consideration of a wider range of tasks in terms of difficulty level is needed to identify the association between task difficulty and cooperative group versus individual performance.

APPENDIX A: Subject Information Sheet

SUBJECT INFORMATION SHEET

Age: _____	Gender: _____
Year in School: _____	Units Enrolled in Spring: _____
Ethnicity:	
Caucasian: _____	Asian American: _____
African American: _____	Hispanic: _____ Other: _____
Have you ever taken an Introduction to Psychology course? Yes No	
If yes, then when did you take the course? _____	
Are you currently enrolled in an Introduction to Psychology course? Yes No	
If so, which one? _____	
Are you currently employed? Yes No If so, how many hours per week? _____	

INFORMED CONSENT

The present study investigates methods of instruction and the advantages associated with them. The entire study should take no more than 90 minutes to complete. You may be asked to participate as the member of a three-person group, or on an individual basis. This study is being conducted by Leslie Haile, an M.S. I/O Psychology graduate student, under the advisement of Janelle Gilbert, Ph.D., Professor of Psychology. If you have any questions about this research, please contact Leslie Haile at (909) 880-0337 or Dr. Gilbert at (909) 880-5587. Dr. Gilbert's office is located in JB-230. The present study has been approved by the Psychology Department Human Subjects Review Board of California State University, San Bernardino. Any information you provide will be completely confidential. At no time will your name be recorded with your responses. Participation in this study is completely voluntary. You have the right to withdraw from your participation at any time during the study.

Participant's Signature

Date

Researcher's Signature

Date

APPENDIX B: Reading Materials

READING MATERIALS

Instructions: Please read and familiarize yourself with the enclosed materials. Please turn the completed assignment in to the research assistant upon completion. You have up to 30 minutes to review these materials.

ANXIETY AND DISSOCIATIVE DISORDERS

Although the behaviors associated with anxiety and dissociative disorders are quite different, they share some significant similarities. These patterns typically are associated with intense and subjectively distressing symptoms. All are seriously disruptive to the lives of those affected; however, none involve a loss of contact with reality. Although the symptoms are distressing, the person can still distinguish what is real from what is not. No hallucinations occur, and no blatant violation of social norms occurs.

Anxiety Disorders

Patterns in which anxiety is the predominant symptom are referred to as anxiety disorders. The experience of anxiety is normal in a variety of situations such as before an exam, a public speech, or a job interview. Anxiety is also a normal reaction to threat and can actually serve as a danger signal that alerts us to emergencies. However, the intense fear and panic associated with anxiety disorders is significantly out of proportion to the situation. The victim suffers heart palpitations, breathlessness, dizziness, apprehension, and sometimes even a vague feeling of impending catastrophe in response to everyday situations. Two major classes of anxiety disorders exist: anxiety states and phobic disorders.

Anxiety states are characterized by chronic anxiety and apprehension. Unlike what occurs in phobias (highly specific fears), the victim's anxiety cannot be so neatly tied to a specific object or event. Instead, the anxiety typically is more general and pervasive, and can strike at any time or place. The three major specific anxiety state disorders include panic attacks, generalized anxiety disorder, and obsessive-compulsive disorder.

Panic attacks are sudden episodes of terror accompanied by physical reactions such as palpitations, choking or smothering sensations, dizziness, vertigo, faintness, trembling, and nausea. The attacks last from a few minutes to half an hour and are so unsettling that the victim often develops a secondary fear that the attack will recur. This dread of a repeated attack is called "anticipatory anxiety." Even a single attack may incapacitate a person for months. Panic attacks are frequently associated with agoraphobia.

A second anxiety state disorder, **generalized anxiety disorder**, involves persistent, uncontrollable anxiety that is unconnected to any particular stimulus. For no apparent reason, the victim feels a powerful but vague sense of apprehension and uneasiness. In contrast to panic attacks, generalized anxiety disorder involves a pervasive feeling of anxiety that the victim experiences more or less continuously for at least six months. The anxiety may vary in intensity, but the pervasive feeling of fear or worry is almost always present.

Another anxiety state disorder, **obsessive-compulsive disorder**, involves a compelling urge to engage in unnecessary and repetitive actions (compulsions), or nagging and unpleasant thoughts (obsessions). Resisting the impulse to do so causes the victim anxiety. Obsessive-compulsive behavior is a ritual of thinking or doing something to control anxiety. Obsessions and compulsions are usually involuntary, and they often run counter to the person's real goals or feelings. Though the victim does not wish to perform the behavior or entertain the thought, he or she is unable to prevent it. For example, the mother of a newborn baby cannot rid herself of the thought that she will drop the child and injure it. In the end, such actions or thoughts often generate more anxiety than they were supposed to control.

In the **phobic disorders**, the victim's anxiety is attached to a particular object or situation, toward which the person manifests unrealistic and illogical fear. Phobic anxiety disorders are defined by three criteria. First, the anxiety must be way out of proportion to reality. Fear of a potentially dangerous snake or spider is appropriate and normal, as is fear of driving through an unfamiliar city in the middle of Friday rush hour traffic. But extreme fear of small worms or of entering a parked automobile is unrealistic and illogical. Second, the victim must recognize or be persuaded that the anxiety is irrational. Otherwise the person would have to be considered "out of contact" with reality rendering them unable to distinguish real fears from those that are illogical or imagined. Third, the anxiety must incite a compelling desire to flee from or otherwise avoid the feared stimulus. One particularly debilitating phobia is agoraphobia, literally defined as the fear of too much space. For most agoraphobics this translates into a fear of leaving home. For some this fear is so great that even a solitary walk to the corner mailbox is terrifying.

Dissociative Disorders

More serious and less common than anxiety disorders are the **dissociative disorders**, which involve a sudden but usually temporary change in normal cognitive activity or motor behavior. Examples include selective memory loss or sudden, unexpected flight from home with the assumption of a new identity and an inability to recall one's previous identity. These disorders are among the most highly publicized and sensationalized of the psychological disorders. The three types of dissociative disorders are psychogenic amnesia, fugue states, and multiple personality.

In **psychogenic amnesia**, past memories are forgotten for no apparent physical cause such as head injury. Suddenly the person is unable to recall important, well-learned

information. Most people experience forgetfulness occasionally. A psychogenic amnesiac's forgetting is far more extensive than a name of the tip of the tongue or a forgotten appointment. For example, after a disagreement with his wife, a man in the army corps with previous experience as a pilot decided to punish his wife by committing suicide. Choosing the most dramatic method he could think of, he stole an airplane and made several passes at a local river, each time pulling up before hitting the water. He was finally persuaded to change his mind but then he discovered that although he knew how to take off, he did not know how to land the unfamiliar plane. After the control tower talked him down and he was met by the police, he found himself unable to remember his name or anything about his identity, his present situation, or the events leading up to it.

A second type of dissociative disorder is the **fugue state** which involves selective memory loss as well as flight from one's present life situation to a new environment. People with this condition wander away, forget their old identity, and assume a new one. One example involved a man who went out to buy a loaf of bread and did not come back for 20 years.

The rarest and most dramatic of the dissociative disorders is the third type: **multiple personality disorder**. A person with multiple personality disorder has two or more distinct personalities, each of which operates independently and often without the awareness of the others. The individual personalities are usually quite different, often opposites. Different personalities dominate at different times, bringing their own memories, behavior patterns, and friendships with them. The transition from one personality to another usually occurs quite quickly (sometimes within seconds) and is frequently triggered by stress, environmental cues, or conflicts between the personalities. Different personalities have been shown to give different responses on psychological tests, have different IQs, show differences in brain-wave patterns, show different responses to the same medication, and have different eyeglass prescriptions. One woman with multiple personality disorder, Trudi Chase, has over 90 different personalities of various ages, races, and genders. Trudi does not think of herself as "a" person, but refers to herself instead as "the troops". In virtually all cases of multiple personality disorder, there is a history of severe and prolonged child abuse. In Trudi's case, she was sexually abused by her stepfather from the time she was two years old until she was sixteen. Her stepfather threatened to kill her if she told anybody what he was doing.

MOOD DISORDERS

Mood disorders involve a pervasive and sustained emotion that produces the prolonged low of a depression, the extended high of elation, or alternating cycles of depression and elation. Like anxiety, emotional ups and downs are normal and appropriate when they signal certain experiences.

Manic and Major Depressive Episodes

A **manic episode** is a mood disturbance characterized by one or more distinct periods in which the predominant mood is either elevated, expansive, or irritable in

conjunction with a number of associated symptoms. Manic episodes are an aspect of **bipolar disorder**, sometimes known as manic-depression. Interestingly, if a manic episode is observed, it is classified as a bipolar depressive disorder, even if the person has never really had an episode of depression. Victims of a manic episode also experience a decreased need for sleep, in severe cases going for days with only two or three hours of sleep per day, if any. Increases in appetite and sexual activity, without regard for consequences, are also common. Characteristically, the victim will engage in actions with very damaging consequences such as going on a buying spree, foolish business investments, or reckless driving.

Significant differences exist between mania and depression. While we have seen mania to be characterized by elevated, expansive, or irritable moods, depression is the reverse. A **major depressive episode** is a mood disturbance characterized by a prominent and relatively persistent mood in which the victim feels sadness, discouragement, and a loss of interest and pleasure for all or most usual activities. The depressive is constantly fatigued, even without any physical exertion. He or she complains of sleep disturbances in which the person has trouble waking up early in the morning or suffers from severe insomnia (difficulty falling asleep or staying asleep). Loss of appetite and substantial weight loss are also common.

APPENDIX C: Study Guide

STUDY GUIDE

You may refer to your reading materials when answering the following questions, and defining the following terms.

ANSWER THE FOLLOWING QUESTIONS:

1. What are anxiety disorders? What are the two major classes of anxiety disorders?

2. What are dissociative disorders? What are the three primary kinds?

3. What are mood disorders? How do they make a person feel?

DEFINE THE FOLLOWING TERMS:

1. Obsession

2. Compulsion

3. Phobic disorders

4. Bipolar disorder

5. Manic episode

6. Major depressive episode

7. Psychogenic amnesia

8. Fugue state

9. Multiple personality disorder

APPENDIX D: Assignment

ASSIGNMENT

Instructions: Please read the following scenario and then answer the corresponding list of questions. It will probably take you no longer than thirty minutes to complete this assignment, however there is no time limit. Please turn the completed assignment in to the research assistant upon completion.

Scenario

(1) When Ryan was three years old, his parents divorced and his mother soon remarried. At first, everything seemed fine until about four months after the marriage when Ryan's step-father started sexually abusing him. The sexual abuse was often accompanied with intense verbal abuse in which Ryan's step-father called him worthless.

(2) John and Jane had been dating for nearly four years when Jane broke up with John, saying that she needed some time to evaluate the relationship. John took the break-up extremely hard and still called Jane 2-4 times a day. One night, while Jane was visiting with a girlfriend, John kept calling. Jane finally unplugged the phone so that she could visit with her friend. While trying unsuccessfully to contact Jane, John was suddenly overcome by a smothering sensation and his heart started racing. He even had to run to the bathroom and throw up.

(3) Lexie was on her way to her first job interview after graduating from college. The job was an entry-level marketing position with a major Los Angeles firm. It would be the perfect job and also would pay enough to allow her to move out of her parent's home and into an apartment of her own. She'd just arrived inside the building and was on her way up to the 5th floor for her interview when she suddenly felt very dizzy. She had to lean against the elevator wall to keep from falling down and she felt quite certain that she might faint.

(4) It was President's Day weekend and several area stores were having big sales. Nells had been up all night long looking through the three area newspapers to make sure she wasn't missing any. After getting her kids ready, Nells loaded them up in the family car and headed to the mall for a day of shopping. Six hours later, after buying nearly \$4,550 worth of clothing, appliances, and stereo equipment, Nells headed back home to her trailer. On her way, she stopped off at the Unemployment Office to pick up her check.

(5) Bonnie and Roger had been dating for a little over three weeks when Roger invited Bonnie over to his apartment to cook dinner together. Bonnie had stopped off at the grocery store and picked up a few items. As Roger was helping her unload the bags, he reached in and pulled out the boneless chicken breasts that she had bought. Suddenly, Roger began experiencing extreme anxiety and fear at seeing the chicken. He dropped it and backed away as though it were a lion that was about to attack him. After Bonnie had calmed him down, she cooked dinner and they ate on the patio. Afterward, Bonnie decided to wait to do the dishes until after they had watched the movie. However, Roger rushed into the kitchen and began cleaning every inch of the kitchen. He even got on his hands and knees to scrub underneath the refrigerator. Bonnie noticed that he had been cleaning up when she got there earlier in the evening. When they finally sat down to watch the movie, Roger got up repeatedly to unload and reload the dishwasher, taking care to thoroughly clean his hands every time.

Assignment

Using the principles discussed your reading materials, answer the following questions. Be as specific as you can, and be sure to provide justification for making your choice. Identify as many of the symptoms as you can. In the event that a person appears to have more than one disorder, indicate which you feel is more severe and why you made that decision. You have been given a page in which to answer each question. Please use as much of it as you need.

(1) What appears to be wrong with John? Explain what happened to him and why.

(2) What kind of disorder could Ryan potentially develop? Why would this happen?

(3) What kind of disorder does Lexie appear to have? Why?

(4) What kind of disorder does Nells appear to have? Why?

(5) What kind of disorder does Roger appear to have? Why?

APPENDIX E: Knowledge Test

TEST

1. Specific anxiety state disorders include all except:
 - * a. Agoraphobia
 - b. Generalized Anxiety Disorder
 - c. Panic Attack
 - d. Obsessive-Compulsive Disorder

2. Psychogenic amnesia, fugue states, and multiple personality are three types of:
 - a. Anxiety Disorders
 - b. Phobic Disorders
 - c. Mood Disorders
 - * d. Dissociative Disorders

3. Bipolar disorder or manic depression involves:
 - a. A period of elevated, expansive, or irritable mood
 - b. A period of sadness, discouragement, and pleasure for all or most usual activities.
 - * c. Both A & B
 - d. None of the above

4. In _____, the victim's anxiety is attached to a particular object or situation, toward which the person manifests unrealistic and illogical fear; whereas _____ cannot be tied to a specific object or event.
 - a. anxiety states; phobic disorders
 - b. obsessive-compulsive disorder; phobic disorders
 - * c. phobic disorders; anxiety states
 - d. phobic disorders; agoraphobia

5. Of the following _____ are most likely to be accompanied by physical reactions such as palpitations, choking or smothering sensations, dizziness, vertigo, trembling, and nausea.
 - a. manic episodes
 - * b. panic attacks
 - c. mood disorders
 - d. anxiety states

6. _____ are compelling urges to engage in unnecessary and repetitive actions; whereas _____ are nagging, unpleasant thoughts.
 - a. phobic reactions; phobic preoccupations
 - b. obsessions; compulsions
 - c. phobic preoccupations; phobic reactions
 - * d. compulsions; obsessions

7. Dissociative disorders involve a sudden but usually temporary change in normal cognitive activity or motor behavior.
 - * a. True.
 - b. False.

8. Amnesia can always be linked to a specific physical cause such as the result of a head injury.
a. True.
* b. False.
9. In virtually all cases of multiple personality disorder, there is a history of:
* a. severe and prolonged sexual abuse
b. mental illness in the family
c. drug and/or alcohol abuse
d. Both A & B
10. People with anxiety disorders experience a break with reality.
* a. True.
b. False.
11. Anxiety which causes a physical reaction is abnormal.
* a. True.
b. False.
12. People with phobias don't realize that their fear is out of proportion with reality.
* a. True.
b. False.
13. People in _____ often flee from their present lives and assume new identities.
a. schizophrenic states
b. phobic states
* c. anxiety states
d. fugue states
14. A manic episode is characterized by:
a. severe insomnia
* b. sadness, discouragement, loss of interest and pleasure for most usual activities.
c. a period in which the predominant mood is either elevated, expansive, or irritable.
d. an explosive temper for no apparent reason
15. People with obsessive-compulsive disorder don't want to perform the behavior yet feel unable to control their actions.
* a. True.
b. False.
16. A person with multiple personality disorder generally has two or more similar personalities.
* a. True.
b. False.
17. For a person to have a bipolar disorder, they must experience both elevated, excited moods as well as depressed moods.
* a. True.
b. False.

APPENDIX F: Rating Guide

Analytical Ability - Ability to synthesize complex information, identify issues and relationships and make causal inferences to identify possible solutions. Gathers sufficient and appropriate information on which to base conclusions.

Attention to Detail - Demonstrates the ability to critically examine assignments to ensure completeness and accuracy; Addresses issues/questions in a concise yet complete manner.

Written Communication Skills - The ability to express oneself in writing using proper grammar, spelling, punctuation; able to convey ideas in a clear, concise and persuasive manner.

Breadth and Depth - This competency refers to the overall quality of the answers. It reflects the degree to which the answers reflect key issues and demonstrate an understanding of the reading materials.

Assignment Rating Worksheet

Scenario 1 (JOHN)

Scenario Answer		Pts.	AA	BD	WC	AD
D1	(a) Anxiety Attack (b) Obsessive Compulsive Disorder	(a) 1 (b) .5				
	<i>Enter Number of Points for D1</i>					
D2	(a) Anxiety Attack (with <i>complete explanation</i> - i.e., refers to physical ailments; refers to info in readings) (b) Obsessive Compulsive Disorder (with <i>complete explanation</i> - i.e., mentions John's obsession with calling Jane; refers to info. in readings) (c) Either (a) or (b) with partial explanation.	(a) 1 (b) 1 (c) .5				
	<i>Enter Number of Points for D2</i>					
D3	(a) Writing is clear, concise, convincing, and persuasive with proper grammar, structure, and word use; writing contains no grammatical or spelling errors. (b) Same as a, except contains 1-2 errors.	(a) 1 (b) .5				
	<i>Enter Number of Points for D3</i>					
D4	(a) Completely addresses the question (i.e., explains what is wrong with John <i>and</i> why); the overall presentation/appearance of the answer is well done. (b) Partially addresses the question (e.g., explains what is wrong with John but fails to address why); or the overall presentation/appearance of the answer is lacking.	(a) 1 (b) .5				
	<i>Enter Number of Points for D4</i>					

Scenario 2 (RYAN)

Scenario Answer		Pts.	AA	BD	WC	AD
D1	(a) Multiple Personality Disorder	(a) 1				
	<i>Enter Number of Points for D1</i>					
D2	(a) Multiple Personality Disorder (with <i>complete</i> explanation- i.e., mentions history of severe child abuse)	(a) 1				
	(b) Multiple Personality Disorder (with <i>partial</i> explanation).	(b) .5				
	<i>Enter Number of Points for D2</i>					
D3	(a) Writing is clear, concise, convincing, and persuasive with proper grammar, structure, and word use; writing contains no grammatical or spelling errors.	(a) 1				
	(b) Same as a, except contains 1-2 errors.	(b) .5				
	<i>Enter Number of Points for D3</i>					
D4	(a) Completely addresses the question (i.e., explains what Ryan could develop <i>and</i> why); the overall presentation/appearance of the answer is well done.	(a) 1				
	(b) Partially addresses the question (e.g., explains what could happen to Ryan but fails to address why); or the overall presentation/appearance of the answer is lacking.	(b) .5				
	<i>Enter Number of Points for D4</i>					

Scenario 3 (LEXIE)

Scenario Answer		Pts.	AA	BD	WC	AD
D1	(a) NOTHING!!!! (b) Anxiety Disorder (experiencing a panic attack) (c) Anxiety Disorder (no further distinction of what kind)	(a) 2 (b) 1 (c) .5				
	<i>Enter Number of Points for D1</i>					
D2	(a) Nothing (with <i>complete</i> explanation- i.e., it's perfectly natural to feel anxious at a job interview) (b) Anxiety Disorder (with <i>complete</i> explanation- i.e., mentions the symptoms that Lexie experienced).	(a) 1 (b) .5				
	<i>Enter Number of Points for D2</i>					
D3	(a) Writing is clear, concise, convincing, and persuasive with proper grammar, structure, and word use; writing contains no grammatical or spelling errors. (b) Same as a, except contains 1-2 errors.	(a) 1 (b) .5				
	<i>Enter Number of Points for D3</i>					
D4	(a) Completely addresses the question (i.e., explains what disorder Lexie appears to have and why); the overall presentation/appearance of the answer is well done. (b) Partially addresses the question (e.g., explains what is wrong with Lexie but fails to address why); or the overall presentation/appearance of the answer is lacking.	(a) 1 (b) .5				
	<i>Enter Number of Points for D4</i>					

Scenario 4 (Nells)

Scenario Answer		Pts.	AA	BD	WC	AD
D1	(a) Bipolar Disorder (b) Manic Episode	(a) 1 (b) .5				
	<i>Enter Number of Points for D1</i>					
D2	(a) Bipolar Disorder (with <i>complete</i> explanation-i.e., mentions shopping spree AND fact she stayed up all night) (b) Bipolar Disorder (with partial explanation-i.e., mentions <i>either</i> shopping spree <i>or</i> that she stayed up all night) (c) Manic Episode (with <i>complete</i> explanation-i.e., mentions shopping spree AND fact she stayed up all night).	(a) 1 (b) .5 (c) .5				
	<i>Enter Number of Points for D2</i>					
D3	(a) Writing is clear, concise, convincing, and persuasive with proper grammar, structure, and word use; writing contains no grammatical or spelling errors. (b) Same as a, except contains 1-2 errors.	(a) 1 (b) .5				
	<i>Enter Number of Points for D3</i>					
D4	(a) Completely addresses the question (i.e., explains what disorder Nells appears to have and why); the overall presentation/appearance of the answer is well done. (b) Partially addresses the question (e.g., explains what is wrong with Nells but fails to address why); or the overall presentation/appearance of the answer is lacking.	(a) 1 (b) .5				
	<i>Enter Number of Points for D4</i>					

Scenario 5 (Roger)

Scenario Answer		Pts.	AA	BD	WC	AD
D1	(a) Phobic Disorder AND Obsessive-Compulsive Disorder (b) Phobic Disorder OR Obsessive-Compulsive Disorder	(a) 1 (b) .5				
	<i>Enter Number of Points for D1</i>					
D2	(a) Phobic Disorder (with <i>complete</i> explanation- i.e., mentions Roger's irrational fear of chickens) AND Obsessive Compulsive Disorder (with complete explanation- i.e., mentions Roger's compulsion to clean) (b) Completely explains only ONE of the disorders. (c) Partially explains BOTH of the disorders.	(a) 1 (b) .5 (c) .5				
	<i>Enter Number of Points for D2</i>					
D3	(a) Writing is clear, concise, convincing, and persuasive with proper grammar, structure, and word use; writing contains no grammatical or spelling errors. (b) Same as a, except contains 1-2 errors.	(a) 1 (b) .5				
	<i>Enter Number of Points for D3</i>					
D4	(a) Completely addresses the question (i.e., explains what disorders Roger appears to have and why); the overall presentation/appearance of the answer is well done. (b) Partially addresses the question (e.g., explains only part of what is wrong with Roger but fails to address why); or the overall presentation/appearance of the answer is lacking.	(a) 1 (b) .5				
	<i>Enter Number of Points for D4</i>					

FINAL SCORING SHEET

SUBJECT: _____

DATE: _____

CONDITION: _____

AREA	Rater 1	Rater 2	Consensus Rating
Analytical Ability	_____	_____	_____
Breadth and Depth	_____	_____	_____
Written Communication Skills	_____	_____	_____
Attention to Detail	_____	_____	_____
Overall Score (total) =			_____

APPENDIX G: Satisfaction Questionnaire

Satisfaction Questionnaire *Cooperative Learning*

Please rate the following items based on the following scale:

1= I strongly disagree with this statement.

2= I disagree with this statement.

3= I neither agree nor disagree with this statement.

4= I agree with this statement.

5= I strongly agree with this statement.

I feel confident with the decisions made by my group.	1	2	3	4	5
I could have done a better job had I been working by myself.	1	2	3	4	5
My experience working with this group was satisfactory.	1	2	3	4	5
The subject matter was interesting.	1	2	3	4	5
I prefer to work in a group.	1	2	3	4	5
I prefer to work alone.	1	2	3	4	5
Completing the study guide helped me when answering questions on the test.	1	2	3	4	5
The test was difficult.	1	2	3	4	5
More time would have improved our group's performance.	1	2	3	4	5
I was familiar with the subject matter before reading it today.	1	2	3	4	5
I needed more time to review the reading materials before discussing it with my group.	1	2	3	4	5
My group needed more time to complete the study guide.	1	2	3	4	5
I enjoyed the task in this study.	1	2	3	4	5
I feel that this learning method was effective.	1	2	3	4	5
Everyone in my group contributed equally to the process.	1	2	3	4	5

Satisfaction Questionnaire

Individualistic Learning

Please rate the following items based on the following scale:

1= I strongly disagree with this statement.

2= I disagree with this statement.

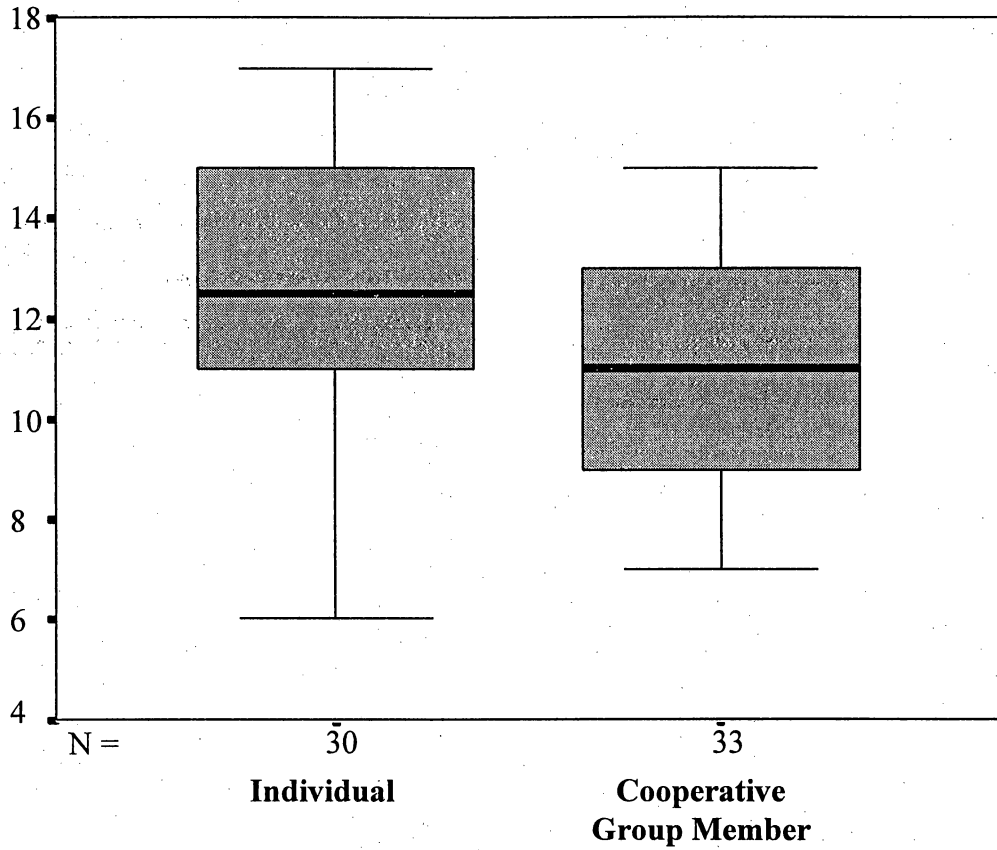
3= I neither agree nor disagree with this statement.

4= I agree with this statement.

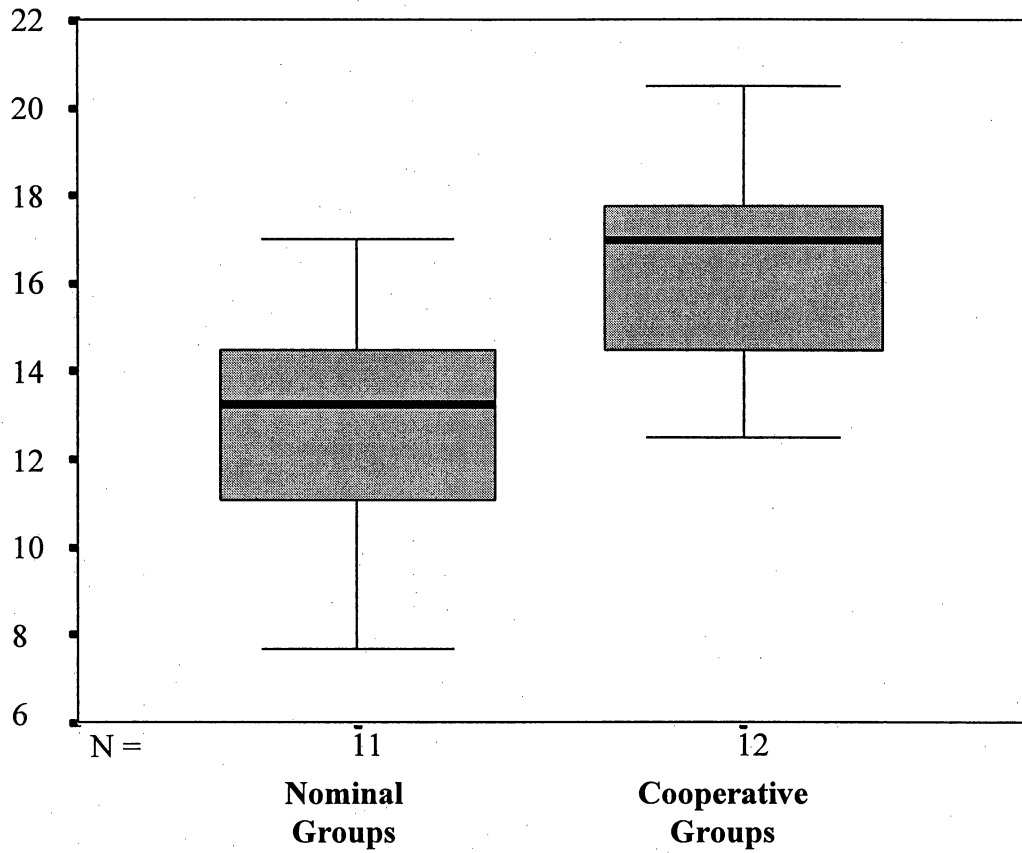
5= I strongly agree with this statement.

I feel confident with the decisions I made.	1	2	3	4	5
I could have done a better job had I been working with a group.	1	2	3	4	5
My experience working on this project was satisfactory.	1	2	3	4	5
The subject matter was interesting.	1	2	3	4	5
I prefer to work in a group.	1	2	3	4	5
I prefer to work alone.	1	2	3	4	5
Completing the study guide helped me when answering questions on the test.	1	2	3	4	5
The test was difficult.	1	2	3	4	5
More time would have improved my performance.	1	2	3	4	5
I was familiar with the subject matter before reading it today.	1	2	3	4	5
I needed more time to review the reading materials.	1	2	3	4	5
I needed more time to complete the study guide.	1	2	3	4	5
I enjoyed the task in this study.	1	2	3	4	5
I feel that this learning method was effective.	1	2	3	4	5

**APPENDIX H: Individual versus Cooperative Group
Member Knowledge Acquisition**

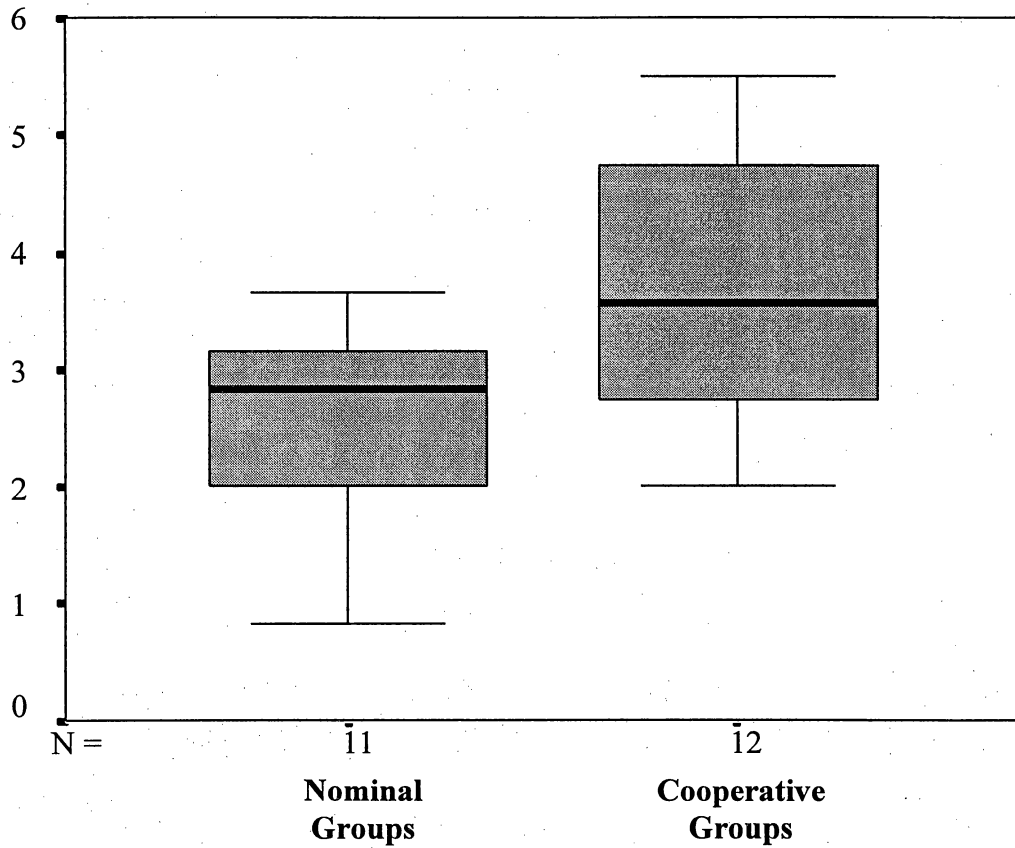


**APPENDIX I: Nominal versus Cooperative
Group Overall Performance**

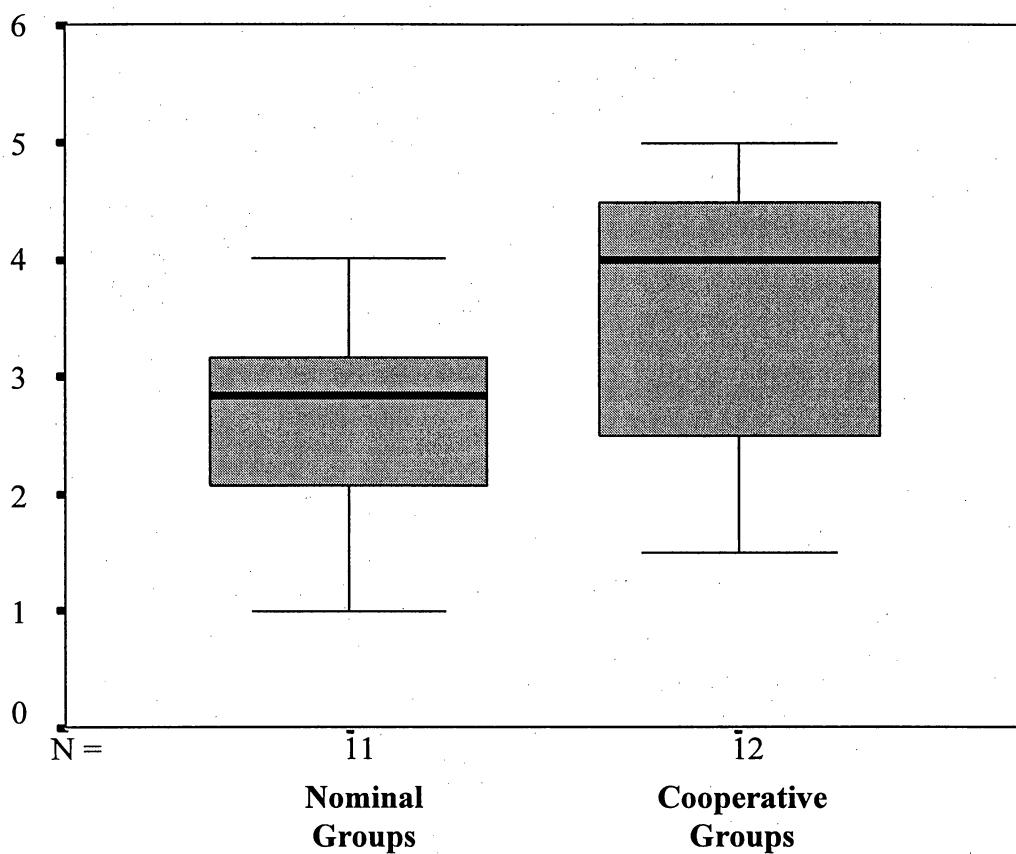


**APPENDIX J: Nominal versus Cooperative
Group Breakdown of Performance**

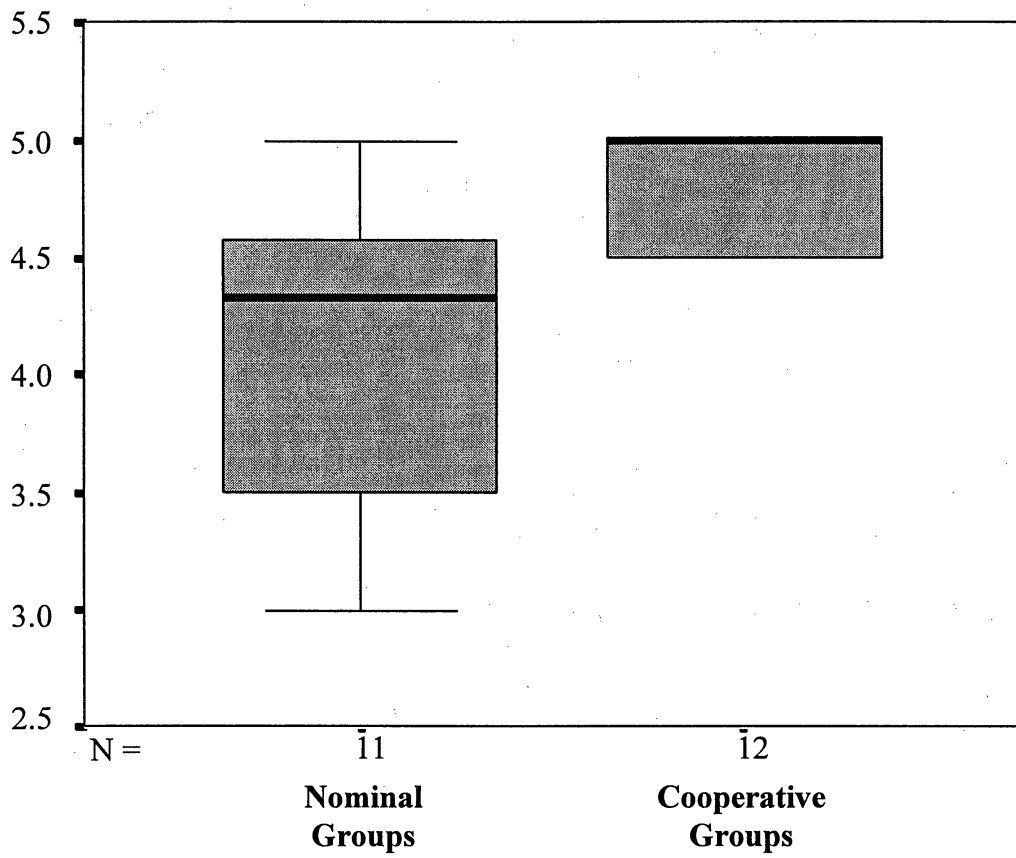
Nominal versus Cooperative Group Performance - Analytical Ability



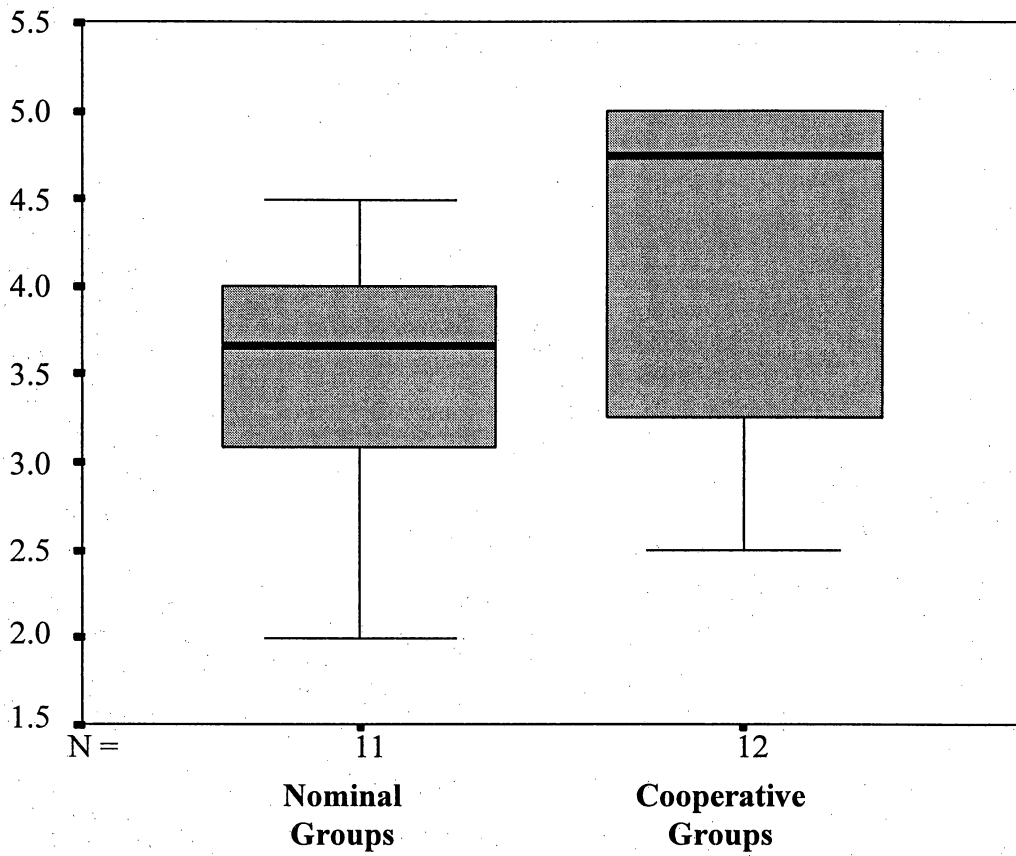
Nominal versus Cooperative Group Performance - Breadth and Depth



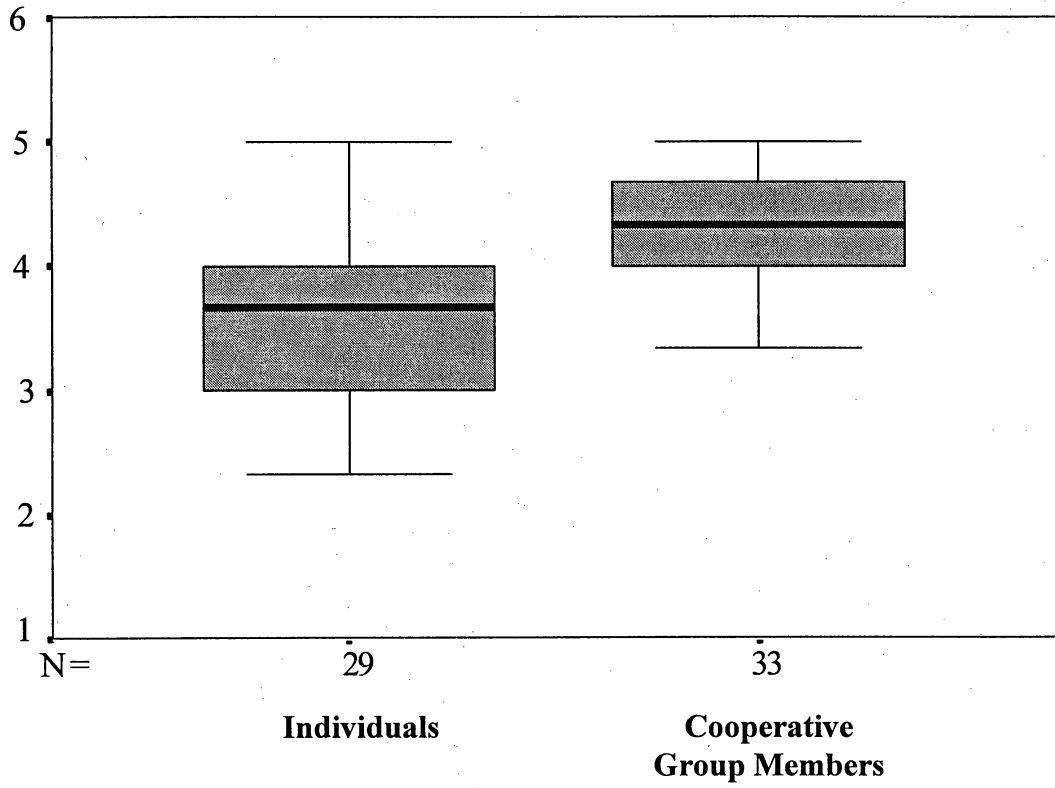
Nominal versus Cooperative Group Performance - Attention to Detail



Nominal versus Cooperative Group Performance - Writing Compositon

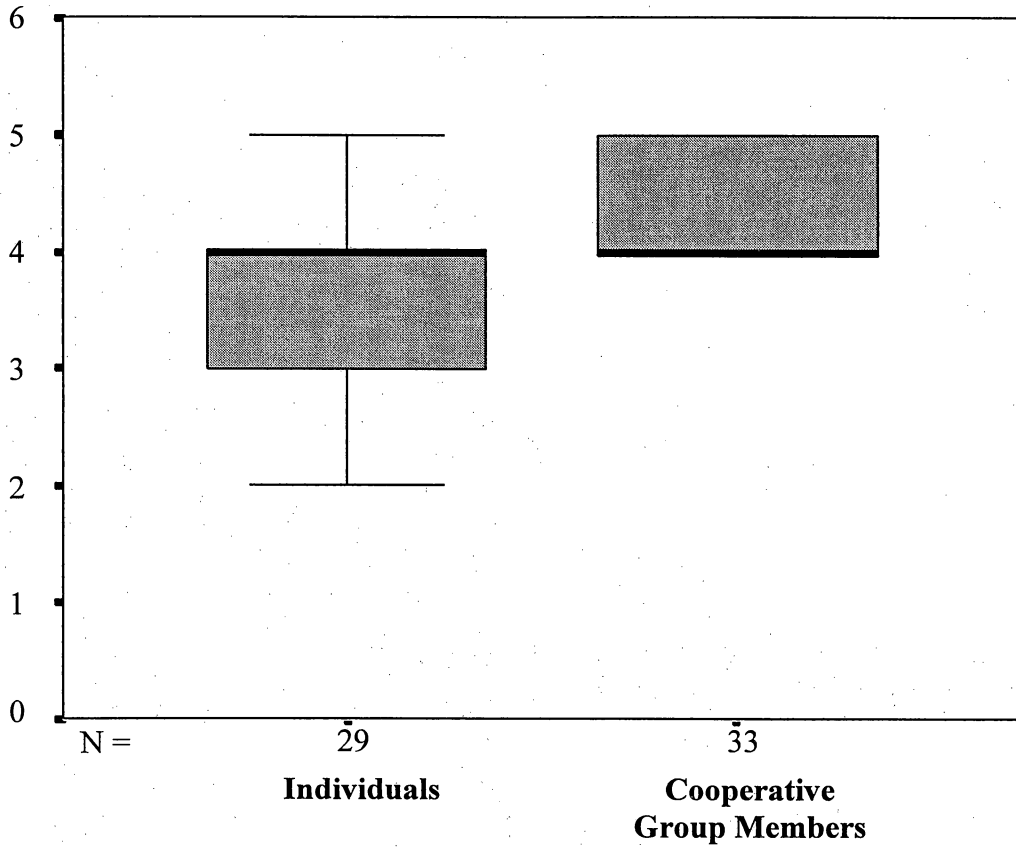


**APPENDIX K: Individual versus Cooperative
Group Member Overall Satisfaction**

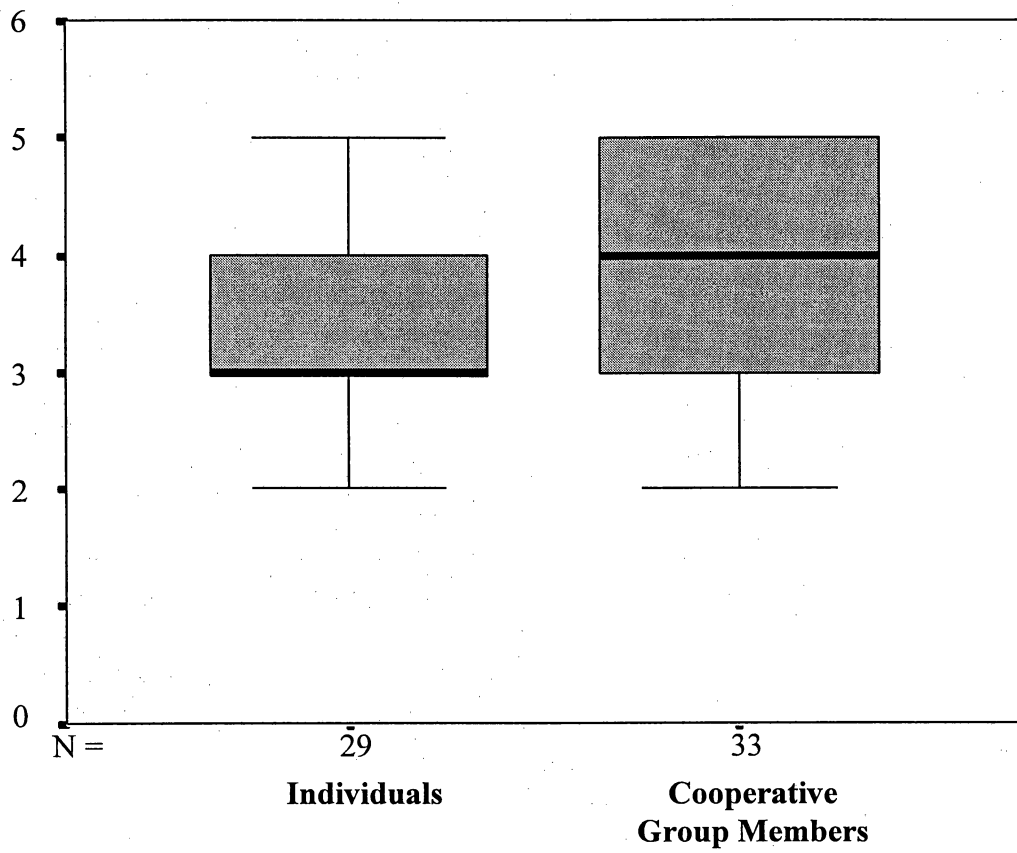


**APPENDIX L: Individual versus Cooperative Group
Member Breakdown of Satisfaction**

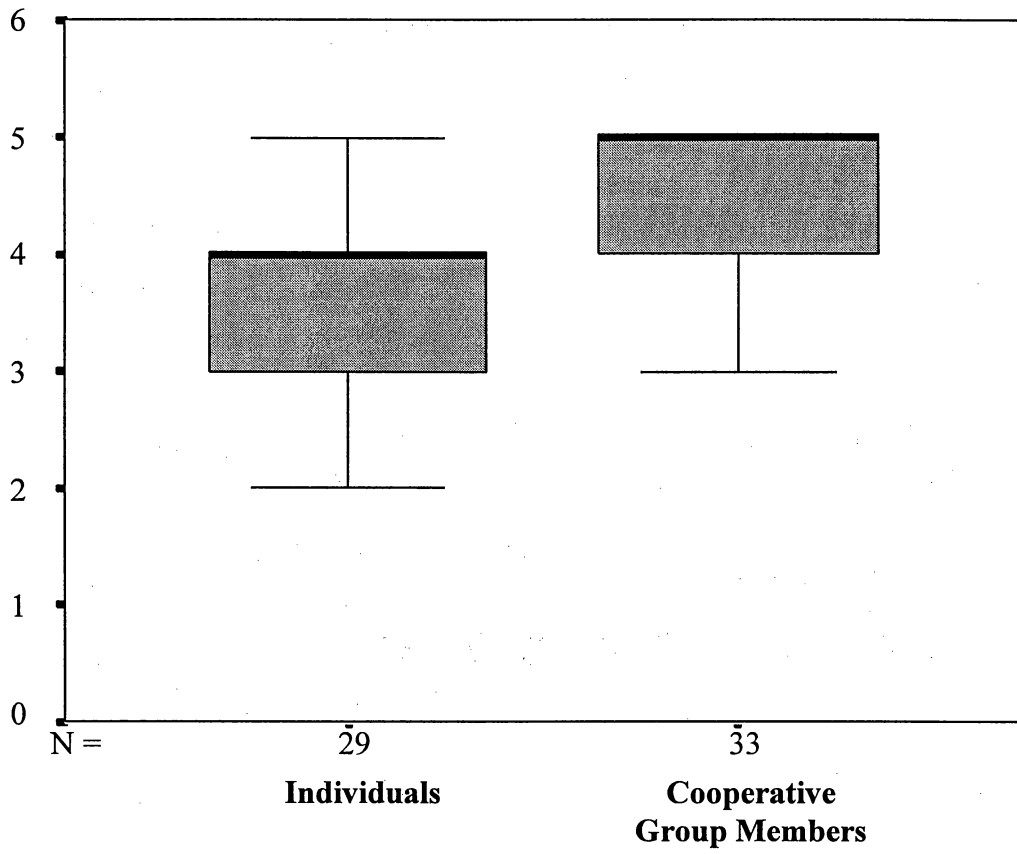
Satisfaction with Learning Condition



Satisfaction with Task



Satisfaction with Performance



APPENDIX M: Correlation Among Variables

	1	2	3	4	5	6
1. Analytical Ability	-					
2. Attention to Detail	.43**	-				
3. Breadth and Depth	.52**	.60**	-			
4. Writing Composition	.45**	.66**	.56**	-		
5. Total Performance	.76**	.81**	.84**	.82**	-	
6. Knowledge Test	.11	.07	.38**	.20	.25*	-
7. Satisfaction with Perf.	.27*	.23	.15	.25*	.28*	-.10
8. Satisfaction with Task	.43**	.33**	.38**	.40**	.48**	-.03
9. Satisfaction with Condition	.36**	.36**	.30*	.35**	.42**	.08
10. Total Satisfaction	.43**	.37**	.33**	.41**	.48**	-.02

* $p < .05$, ** $p < .01$

	7	8	9	10
1. Analytical Ability	.27*	.43**	.36**	.43**
2. Attention to Detail	.23	.33**	.36**	.37**
3. Breadth and Depth	.15	.38**	.29*	.33**
4. Writing Composition	.25*	.40**	.35**	.41**
5. Total Performance	.28*	.48**	.42**	.48**
6. Knowledge Test	-.10	-.03	.08	-.02
7. Satisfaction with Perf.	-			
8. Satisfaction with Task	.45**	-		
9. Satisfaction with Condition	.56**	.51**	-	
10. Total Satisfaction	.83**	.79**	.84**	-

* $p < .05$, ** $p < .01$

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